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2. WARNINGS AND LABELS

TO MINIMIZE THE RISK OF FIRE, INJURY BY ELECTRIC SHOCK OR SERIOUS INJURIES TO PEOPLE OR PROPERTY DAMAGE, PLEASE READ AND FOLLOW THE FOLLOWING INSTRUCTIONS:

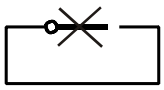
– This English version is original language version. Without this original version, these instructions are incomplete.
– Before installation, operation and maintenance of the machine read carefully the complete instructions, i.e. this „Installation, maintenance and user's manual“, „Programming manual“ and „Spare parts manual“. The Programming manual and Spare parts manual are not delivered with a machine by default. You shall ask the supplier / manufacturer to obtain Programming manual and Spare parts manual.
– Follow the instruction written in manuals and keep the manuals in a proper place by the machine for later use.
– The washer extractor is designed for fabrics washing only, other objects can damage the machine and can cause damage or injuries.
– The manufacturer is not responsible for the damage to the fabrics that are washed by an inappropriate washing method.
– Always follow instructions and/or warnings that are stated on the fabrics, washing products or cleaning products mentioned by the manufacturer.
– If the machine is used for special applications follow the instructions and warning to avoid person injury.
– Keep the washer extractor surface and surrounding clean and free of flammable materials.
– Do not put fabrics treated with flammable products in the washer extractor. Such fabrics must first be washed by hand and air dried.
– Store laundry aids, dry-cleaning solvents and disinfectants out of the reach of children, preferably in a locked cabinet.
– Do not tamper the washer-extractor controls and follow the safety instructions and the warnings.
– Do not remove warning signs placed on the machine. Follow instructions on signs and labels to avoid personal injuries.
– Do not use some means on the soap dispenser lid to hold it open by filling or when the machine operates. The discharge or splashing of hazardous liquid can cause serious scalding and burning.
– The use of hypochlorite will cause corrosion which may cause component failure under certain circumstances.
– The warranty of the machine cannot be accepted in case corrosion was caused by chlorine and chlorine compounds impact.
– Do not operate the washer extractor when parts are broken or missing or when covers are open. The machine must not be operated until the fixed guards are put correctly in place.
– The washer extractor is not designed for work which may create an explosive atmosphere inside the machine and will not be used for this purpose.
– In case of steam escaping anywhere in the machine, shut off the main steam supply valve and call for maintenance.
– Under certain conditions, hydrogen gas may be created in the hot water system that has not been used for two or more weeks. Hydrogen gas is explosive. If the hot water system has not been used for such period, open all hot water taps and let the water run out for few minutes. This will release any accumulated gas. As this gas is flammable, do not smoke or use open flames during this time.
– In case of danger turn off the main switch or other emergency disconnection devices.
– Turn off the main water supply at the end of each operating day.
– Only qualified service personnel can execute service on the washer extractor.
– Follow all valid and basic safety rules and laws.
– It is obvious that it is impossible to mention each possible risk in this manual. It is up to the user to proceed as careful as possible.
– The manufacturer reserves the right to change the manuals without previous notice.
– If a problem should arise, contact your dealer for assistance.

⚠ WARNING!
IF THE INSTALLED APPLIANCE OPERATE WITH COIN, TOKEN OR SIMILAR OPERATION FOR USE IN SELF-SERVICE SITUATIONS, THEN THE OWNER-INSTALLER MUST PROVIDE A REMOTE-LOCATED EMERGENCY STOP DEVICE. THIS DEVICE MUST BE PLACED IN SUCH A WAY THAT IT IS EASY AND SAFELY ACCESSIBLE FOR THE USERS. THE EMERGENCY STOP DEVICE TAKES CARE THAT AT LEAST THE CONTROL CIRCUIT OF THE APPLIANCE IS INTERRUPTED.

⚠ WARNING!
DO NOT TOUCH THE DOORGLASS UNTIL CYCLE HAS BEEN COMPLETED. DO NOT OPEN DOOR UNTIL CYLINDER REMAINS STOPPED AND WATER HAS BEEN DRAINED FROM CYLINDER.
DO NOT PUT ARTICLES SOILED WITH EXPLOSIF SOLVENTS AND/OR DANGEROUS CHEMICAL PRODUCTS IN THE MACHINE. THIS MACHINE SHOULD NOT BE USED BY CHILDREN.
DO NOT LET CHILDREN PLAY IN, ON, OR AROUND THE MACHINE. BEFORE TURNING THE MACHINE „ON“, MAKE SURE THAT THERE ARE NO PEOPLE OR ANIMALS PRESENT IN OR AROUND THE MACHINE.

WARNING!
Always disconnect the washer from the electrical supply before attempting any service. The washer extractor is out of tension if the main plug is taken out or when the main supply is disconnected. When the main switch is turned off the inlet terminals of the machine main switch are still under current!

CAUTION!
Extreme hot conditions can arise in the surroundings of this air. Watch out for vapor that escapes from the washer extractor venting!



CAUTION!
Do not cover the washer extractor venting. It serves as a vapor outlet to prevent pressure building in the washer extractor.

⚠ WARNING!
ORIGINAL OR IDENTICAL PARTS MUST BE USED FOR REPLACEMENT IN THIS MACHINE. AFTER SERVICING REPLACE AND SECURE ALL PANELS IN THE ORIGINAL WAY. TAKE THESE MEASURES FOR CONTINUED PROTECTION AGAINST ELECTRICAL SHOCK, INJURY, FIRE AND/OR PROPERTY DAMAGE.

⚠ WARNING!
SAFETY LABELS APPEAR AT CRUCIAL LOCATIONS ON THE MACHINE. FAILURE TO MAINTAIN LEGIBLE SAFETY LABELS COULD RESULT IN INJURY TO THE OPERATOR OR SERVICE TECHNICIAN.

2.1. INSTRUCTIONS FOR MAINTENANCE, ADJUSTMENT AND SAFETY OF PEOPLE

Some important information for the usage of the machine are not (or only partly) mentioned in this „User's manual". Missing information is possible to find in „Installation and maintenance manual" according to the following references.

1. Manipulation, transportation, storage
2. Putting the machine into service
3. Technical specification
4. Putting the machine out of service
5. Description of the safe work system when maintenance is performed, adjustment, and when eliminating defects
6. Procedures on searching for defects, cleaning, maintenance
7. Heat risks
8. Description of qualities for ventilation
9. Loss of stability
10. Electric risks
11. Minimal water level
12. Sight holes
13. Water supply

3. SYMBOLS ON THE MACHINE (DEPENDING ON THE MACHINE MODEL)

Caution, dangerous electrical tension, electrical devices

Caution, other danger, read and follow written instructions

Caution - Increased temperature

Transfer of heat in general

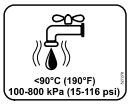
Do not close or cover

Do not put your hands on the marked area

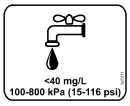
The machine hot air outlet

In case of emergency press the emergency button to stop the machine

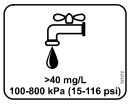
Button of drum positioning



Warm water inlet
(red color of the label)



Soft cold water inlet
(light blue color of the label)



Hard cold water inlet
(dark blue of the label)

The machine is switched over to programming regime

Machine in operation

Press to unblock the door

Press to unblock the door

Button of door locking

Signal of machine running (+ operating air pressure)

Button of activation of loading side

Signal of loading

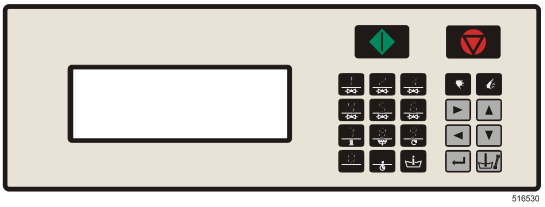
The holes to be drilled not punched

Steam

505680B

Fig. 3.A Symbols on the machine

GRAPHITRONIC MICROPROCESSOR



START (advancing program)

STOP (interrupting program)

YES SELECTION

NO SELECTION

INCREASING SEQUENCE TIME

DECREASING SEQUENCE TIME

INFO (overview available wash programs and wash sequence functions)

SERVIS (shows actual water temperature and level, number of fulfilled cycles and actual states)

ACTIVATES THE TIME DELAY FUNCTION (delay time will be started by pressing start)

OPENING THE INLET VALVES

ACTIVATE HEATING

OPEN DRAIN VALVE

SPEED ADJUST

ENTER - SELECTION OR CONFIRMATION

507352C

Fig.3.B Symbols on the programmer keyboard

4. OPERATING INSTRUCTIONS

4.1. BEFORE WASHING

Sort the linen according to temperature and instructions determined by fabric manufacturer. Check if there aren't any strange objects between the linen like nails, screws, needles, etc. to prevent the washer-extractor or linen damage. Turn sleeves of shirts, blouses, etc. inside out. To get a better washing result mix the bigger and smaller pieces of linen and put them into the washer separately.

APPLICATED SYMBOLS

„A“ – valid for machines with capacity 70 kg / 160 lbs, 2 - chamber washing drum
„B“ – valid for machines with capacity 70 kg / 160 lbs, 3 - chamber washing drum
„C“ – valid for machines with capacity 90 kg / 200 lbs, 2 - chamber washing drum
„D“ – valid for machines with capacity 90 kg / 200 lbs, 3 - chamber washing drum
„E“ – valid for machines with capacity 110 kg / 245 lbs, 2 - chamber washing drum
„F“ – valid for machines with capacity 110 kg / 245 lbs, 3 - chamber washing drum
„G“ – valid for machines with capacity 140 kg / 310 lbs, 2 - chamber washing drum
„H“ – valid for machines with capacity 140 kg / 310 lbs, 3 - chamber washing drum
„I“ – valid for machines with capacity 180 kg / 400 lbs, 2 - chamber washing drum
„J“ – valid for machines with capacity 180 kg / 400 lbs, 3 - chamber washing drum

LOADING THE LINEN - DIRTY SIDE

Sort out the linen and weigh it according to following table:

	CAPACITY									
	RATE 1:10									
MACHINE	**A**	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**I**	**J**
kg	2x35	3x23,3	2x45	3x30	2x55	3x36,6	2x70	3x46	2x90	3x60
lb	2x77	3x51	2x99	3x66	2x121	3x80	2x154	3x101	2x198	3x132

	KAPACITA									
	POMĚR 1:11									
MACHINE	**A**	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**I**	**J**
kg	2x31,8	3x21	2x40,9	3x27,2	2x50	3x33,3	2x63,6	2x41,8	2x81,8	3x54,5
lb	2x70	3x46	2x90	3x60	2x110	3x73	2x140	3x91,8	2x180	3x120

Tab. 4.1.

Fig. 4.1.A, Machine **„I“**, **„J“**

The following instructions are applicable for all machines **„A“, „B“, „C“, „D“, „E“, „F“, „G“, „H“, „I“, „J“:**
1. Open an air supply.
2. Turn on the main switch, or possibly release the centralstop buttons.

On the loading side the following symbols will light up:

– operation pilot-light and instruction „Select Process“ occurs on the programmer display

– button for automatic turn of the washing drum

– button for opening the outer door

The following symbol will not light up:

– button for closing the outer door

The pilot lights of **loading** are **on** at the **unloading side**.

3. Push the button for automatic turn of the washing drum. The washing drum is turned into the correct position and it is braked.
4. Push the button for opening the outer door. By this hook closure of the outer door is opened.
5. Open the outer door, the gas spring will lift the door up to the upper extreme position.
6. Opening the door of the washing drum, fig. 4.1.B:
   - tilt the safety element, pos.2
   - turn the segment lever, pos.1 to its extreme position outwards. This lever is moving approximately 90° outwards
   - release the safety element, pos.2, the torsion spring will put it back to its original position
   - now it is possible to open the washing drum door manually
7. Fill the washing drum chamber with appropriate quantity of linen according to table 4.1.
8. Closing the washing drum door, fig. 4.1.B:
   - close the washing drum door manually
   - tilt the safety element, pos.2
   - turn the segment lever, pos.1, inwards to its extreme position
   - release the safety element, pos.2, the torsion spring will put it back to safety position. Always care for the precise clamping the safety element, pos.2, by the stop, pos. 3. Then the washing drum door is closed correctly
9. Segment lever at the same time prevents the situation when the outer door drum is closed without shifting this lever back to closing position.

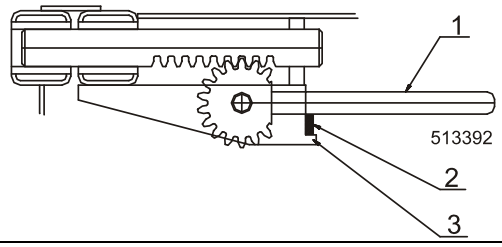


Fig.4.1.B

⚠ WARNING!
ALWAYS CARE FOR THE CORRECT CLOSING OF THE WASHING DRUM DOOR AND ESPECIALLY FOR THE PRECISE CLAMPING OF THE SAFETY ELEMENT BEHIND THE SAFETY SHEET!

⚠WARNING!
THE MACHINE MUST NOT BE PUT IN OPERATION UNLESS THE LOCK OF THE WASHING DRUM DOOR AND SAFETY ELEMENT ARE NOT IN A GOOD CONDITION! NON-PERFORMANCE OF THE SAFETY MEASURES CAN CAUSE THE MOST SERIOUS DAMAGES!

10. Close the outer door by pulling downwards, the gas spring will push the door to an extreme position inwards.
11. Push the button for closing the outer door. By this hook closure of the the outer door is locked.

⚠ WARNING!
ALWAYS CARE FOR THE CORRECT LOADING ALL CHAMBERS OF THE WASHING DRUM!
QUANTITY OF LINEN MUST NOT EXCEED THE MACHINE CAPACITY!
OVERLOADING CAN CAUSE POOR WASHING RESULT!
SMALL QUANTITY OF LINEN CAN CAUSE WRONG FUNCTION OF THE MACHINE!

4.2. PROGRAM SELECTION

Choose one of the available wash programs, best corresponding to the quality of linen and allowed wash temperature in the wash load. Selection of the program determines temperature and time for washing and rinsing.

Note: To change factory settings and/ or washing programs and for other settings options - see Programming manual.

4.3. WASH PROGRAMS OVERVIEW

Wash program 1:	Hot wash	90°C	
Wash program 2:	Warm wash	60°C	
Wash program 3:	Coloured wash	40°C	
Wash program 4:	Bright coloured wash	30°C	
Wash program 5:	Woollens	15°C	
Wash program 6:	Hot wash	90°C	ECONOMY level
Wash program 7:	Warm wash	60°C	ECONOMY level
Wash program 8:	Coloured wash	40°C	ECONOMY level
Wash program 9:	Bright coloured wash	30°C	ECONOMY level
Wash program 10:	Hot wash	90°C	SUPER ECONOMY level
Wash program 11:	Warm wash	60°C	SUPER ECONOMY level
Wash program 12:	Coloured wash	40°C	SUPER ECONOMY level
Wash program 13:	Bright coloured wash	30°C	SUPER ECONOMY level
Wash program 14:	Extraction		low speed
Wash program 15:	Extraction		high speed

LAYOUT OF WASH PROGRAM FOR MACHINE WITH RECYCLING TANKS AND FOR SET WITH RECYCLING PROCESS

WASH PROGRAM 20: HOT WASH 90°C

	Sequence		Supply		Inlet		Temp.	Level	Wash action	Time	RPM
	Top	Front	Top	Front	Top	Front					
Step 1	Prewash	Wash	A	A=30“	2-3	4	35°C	NL	A=12“ R=3“	6 min	W
	Spin	Spin	-	-	-	-	-	-	-	1 min	L
Step 2	Wash	Wash	B	B=30“	3-4-5	2	90°C	NL	A=12“ R=3“	10 min	W
	Drain	Drain	-	-	-	-	-	-	-	30 sec	D
Step 3	Rinse 1	Rinse 1	-	-	2-5-6	1	-	NH	A=12“ R=3“	2 min	W
	Spin	Spin	-	-	-	-	-	-	-	MIN 3 min	L
Step 4	Rinse 2	Rinse 2	-	-	2-5-6	1	-	NH	A=12“ R=3“	2 min	W
	Spin	Spin	-	-	-	-	-	-	-	MIN 3 min	L
Step 5	Final Rinse	Rinse 3	C	D=30“	1(+6)	1	-	NL	A=12“ R=3“	3 min	W
	Spin	Spin	-	-	-	-	-	-	-	6 min	H
	Slowdown		-	-	-	-	-	-	-	1 min	-
	Tumble		-	-	-	-	-	-	A=12“ R=3“	30 sec	W

Note: If you want to drain the water to the recycling tank, select the drain valve DV2 in the drain step.

⚠ WARNING!
FOR TEMPERATURE HIGHER THEN 60°C, IS NOT POSSIBLE SET DRAINING TO RECYCLING TANK DV2.

⚠ WARNING!
IN CASE OF USING RECYCLING TANKS THE FUNCTION "TEMPERATURE BALANCE" MUST BE ABORTED IN THE INSTALLATION MENU.

4.4. ADD DETERGENTS

Fill the soap dispenser at the side of the washer extractor depending of the chosen program.

- **Dispenser A: 1 st Wash**
- **Dispenser B: 2 nd Wash**
- **Dispenser D: Last Rinse**

Add the detergents before the start of the wash cycle. The machine „**I**“, „**J**“ has two bodies of soap hopper, see fig. 4.1.A. Always fill both hoppers with soap.

❑ **For washing machines connected to liquid soap supply system.**
Check if the liquid soap supply system is in operation and if there is sufficient quantity of liquid soap.

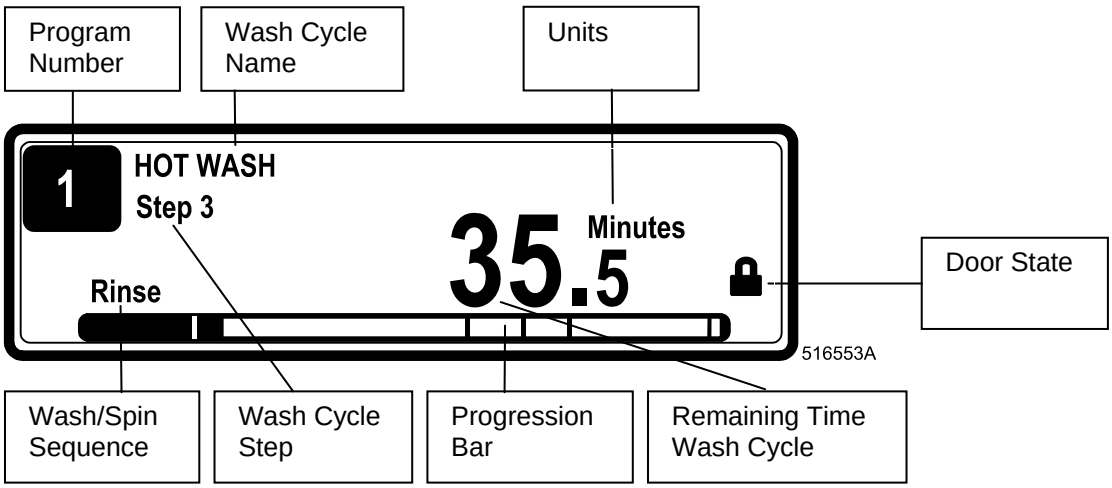
❑ **Standard wash programs versus custom made wash programs.**
This explanation is only valid for standard wash programs. For custom made programs, it is possible that other dispensers have been selected. (See „Programming manual“).

❑ **Remark:** It is advisable to use only detergents with „reduced foaming“ which can easily be found in retail shops. The dosage of soap to use is generally mentioned on the packing. An overdose of detergent can lead to poor wash results and „suds“ overflow which can damage the machine. When contaminated laundry is washed, the effectiveness of germicide process depends on the type of laundry, degree of dirtiness, type of soap and structure of washing cycle. Take care that the lid of the soap dispenser is closed when the machine starts.

4.5. START THE WASHER EXTRACTOR

GRAPHITRONIC MICROPROCESSOR

After selecting the desired wash program number, by pressing the **START** button the wash cycle will be started. If there is no washing program available for the selected program number, **INVALID** will be displayed.



ATTENTION!
The program can only be started when the key switch is in Run Mode.

⚠ **WARNING!**
IF "NOT READY/DOOR" IS DISPLAYED, IT IS NOT POSSIBLE TO START WASHING CYCLE.
CHECK WHETHER:
- THE DRUM DOOR IS CLOSED
- THE PRESSURE OF COMPRESSED AIR SUPPLY IS IN PRESCRIBED RANGE.
CHECK ON THE MACHINE PRESSURE METER.

4.6. END OF WASH CYCLE

⚠ WHEN THE POWER SUPPLY HAS BEEN CUT, THE DOOR WILL BE AUTOMATICALLY BLOCKED AGAINST OPENING. AFTER COOLING DOWN THE WASHING BATH, THE DOOR CAN BE OPENED ACCORDING TO THE INSTALLATION AND MAINTENANCE MANUAL.

At the end of the wash cycle, when the remaining program time reaches „0“, **PROGRAM END** is displayed. When **UNLOAD** appears on the display, the machine clean side is activated and you can unload the linen.

4.7. UNLOADING THE LINEN - CLEAN SIDE

1. On the machine clean side the following symbols will light up:

– button for automatic turn of the washing drum

– button for opening the outer door

Following symbols will not light up:

– button for closing the outer door

– signal light for loading

Perform procedure for positioning the washing drum and opening the door according to the chapters 4.1. points 3 to 6.

2. Unload a particular chamber of the washing drum.

Perform procedure for closing the door according to the chapters 4.1., points 8 to 11.

After unloading push the button for the **loading** side activation . Doing this you activate the door on **loading** side. The signal light for loading is ON.

4.8. HOW TO OPEN DOOR WHEN FAILURE OCCURS

See Installation and maintenance manual.

5. FIRST SERVICE AT TECHNICAL PROBLEM

N°	Failure message	Failure	Action	Fault occurrence
E1	No Drain Co	Drain failure Cooldown	Full Stop + tumble	Draining sequence Cooldown
E2	No Drain	Drain failure	Full Stop + tumble	Draining sequence
E3	Tilt Fault	Out of balance : Before spin	Full stop + tumble	Start spin
E4	Imbalance	Out of balance : Normal spin	Skip + continue	After 10 x tilt
E5	Tilt High Sp	Out of balance : high spin	Full stop + safety time	>500 or 750 RPM
E6	Door Coil	Door switch failure	Full stop + safety time	Whole cycle
E7	Door Switch	Door solenoid switch failure	Full stop + safety time	Whole cycle
E8	Door Start	Door lock check at start failure	Don't start	At start up
E9	Door Unload	Door lock switch closed failure	Don't start	End cycle
E10	Bimetal/Spring	Bimetal/Spring	Continue	2 min 30 sec after start cycle
E11	No Fill	Fill failure	Full stop + request for Continue	While filling
E12	Overfill	Overfill failure	Full stop + tumble	While filling
E13	No Heating	Heating failure	Full stop + tumble	While heating
E14	Heat Time	Heating time failure	Full stop + request for Continue	While heating
E15	Too Hot	Too Hot	Full stop + tumble	While heating
E21	Overflow	Overflow failure	Full stop + tumble	Wash step
E22	Flush fault	Flush failure	Full stop + tumble	Flush step
E24	Level Sens	Defective level sensor	Continue + Don't start	Before start up
E25	Temp Sensor	Defective temperature sensor	Continue + Don't start	Before start up
E26	Mitsub code	Undefined frequency inverter error code	Full stop + tumble	Whole cycle
E27	Comm fault	Communication fault inverter	Full stop + safety time	Whole cycle
E28	THT time / E.OL	THT Time out / E.OL	Full stop + safety time	At spin sequence
E29	OV3 time / E.OP	OV3 Time out / E.OP	Full stop + safety time	At spin sequence
E31	Load Parr	Initialization fault inverter	Don't start	At initialization
E32	Verify Parr	Verification fault inverter	Don't start	At loading parameters
E33	Stall prev	Stall prevention function active	Continue	At spin sequence
E35	Wrong Softw	Wrong software version	Don't start	New software version
E37	No Drain Sp	Drain failure at the Spray Sequence	Full stop + tumble	Spray Sequence
E38	No Recycle	The Tank with recycle water is empty	Warning at the End. Front soap dispenser Mach. only	Wash step
E39	Out of Soap	The Soap Supplies are running Out of Soap	For Info only	Wash step
E40	No Fill Rec	Fill failure due to an empty water recycle Tank	Full stop + Request for Continue Top soap dispenser Mach. only	Wash step
E41	Service Due	Service Due Warning	For Info only Open door = reset	End cycle
E42	Connection	No Network Connection	For Info only	Data Transfer Networking
E43	Voltage Par	Wrong Voltage Range Selection	Make correct selection	Configuration menu
E44	Model type	Wrong Inverter Model Type	Make correct selection	Configuration menu
E45	No Speed Sensor Signal	No Speed pulses when drum turns.	Continue + Warning	At spin sequence (FS120 only)
E46	Brake Closed	Brake Stays Closed	Full stop + safety time	At spin sequence (FS120 only)

E47	Brake Wear Out	Friction blocks brake are wear-out	Full stop + safety time	Any time (FS120 only)
E48	Brake Open	Brake Stays Open	Continue + Warning	At spin sequence (FS120 only)
E49	UnBalance Switch At Wash	Air suspension without compressed air	Full stop + safety time	Wash action (FS120 only)
E50	No Second Acceleration Ramp	Missing wire bridge inverter / wrong inverter parameters	Continue	At spin sequence (FS120 only)
E51	No Third Acceleration Ramp	Missing wire bridge inverter / wrong inverter parameters	Continue	At spin sequence (FS120 only)
E52	Board Memory	PCB-EEPRROM CRC failure	Don't start	At Power Up
E53	Board Data	PCB-EEPROM Data out of range failure	Don't Start	At Power Up
E57	Lock System	Door Lock Switch stays closed when the outer door is open.	Don't Start	At locking sequence (MB70-90-110-140-180 only)
E58	No Free Run	Deceleration end of spin while brake is closed.	Full stop + safety time	At spin sequence (FS120 only)
E59	Run Free Run	Run Status inverter =1 while brake is closed.	Full stop + safety time	At spin sequence (FS120 only)
E60	No reset Drive	No detection motor speed signal at wash	Full stop + safety time	Wash Sequence
E61	Continue spin	Motor doesn't stop spinning anymore	Full stop + safety time	Whole cycle
E62	Extended speed	Motor spins too fast	Full stop + safety time	Whole cycle
E63-E67	Motor Drive	Reset Motor Drive for E60, E61 & E62	Reset Motor Drive	Wash Sequence
E68	No Sign Spin	No detection motor speed signal at spin	Full stop + tumble	Spin Sequence
E69	RS Unbalance	Unbalance input should not be high on R machines	Don't Start Full stop + tumble	Start Spin sequence Whole cycle
E70	RS7 Select	RS7 selected in case of RS10	Don't Start	Start Cycle
E71	RS10 Select	RS10 selected in case of RS7	Don't Start	Start Cycle
E72	KEB ST LOW	No wire bridge terminals 16-20	Don't Start	Start cycle
E73	KEB ST HIGH	No KEB parameters loaded in inverter	Full stop + safety time	Start cycle
E74	CFIStuck	Inverter not switched off at end of cycle.	For Info only	End of cycle
E75	KEB code	Undefined frequency inverter error code	Full stop + tumble	Whole cycle
E78	Lock Active	At standby door lock is locked nevertheless door is open.	Don't Start	At Standby
E79	Lock Start	After pressing Start door lock is locked nevertheless door is open.	Don't Start	At Start Cycle
E80	Time Out Input16	On Hold Signal Failure Soap Dispensing System	Full stop + tumble.	Whole cycle
E81	No Reheat	Heating Failure	Full stop + tumble.	Wash Step (MB only)
E82	No Refill	Refill failure	Full stop + request for Continue	Wash Step (MB only)
E83	Cycle Fail	No successful wash cycle termination	Info that the wash cycle has to be repeated.	Abnormal Cycle Termination (MB only)
E84	No Store PC	Communication failure with PC	For Info only.	End cycle (MB only)

E85	RTC Low Batt	Real Time Clock, No Battery or battery low power	For Info only.	End cycle (MB only)
E86	No RTC Comm	Real Time Clock is not available	For Info only.	End cycle (MB only)
E100	Weigh No Comm	Communication fault weighing system	Full Stop Tumble	Before Start (MB16-MB180) Whole Cycle (MB16-MB66) (MB & FS23-55 only)
E101	Weigh Low	Weight machine is too low	Don't Start	Before Start (MB & FS23-55 only)
E102	Weigh High	Weight machine is too high	Don't Start	Before Start (MB & FS23-55 only)
E103	Weigh Balance	Weight is not balanced over 4 load cell's.	Don't Start	Before Start (MB & FS23-55 only)
E104	Weigh Overload	Weight on individual load cell exceeds max.	Full Stop Tumble	Whole Cycle (MB16-66 & FS23-55 only)
E105	Weigh Airbags	No functional air pressure system	Don't Start	Before Start (MB70-180 only)
E300-E353	MITS ERR	Specific Mitsubishi Inverter Alarm	Full stop + safety time	Whole cycle
E400-E441	KEB ERR	Specific KEB Inverter Alarm	Full stop + safety time	Whole cycle
E500-E515	MEMORY ERR	Memory Error	Full stop + safety time	Any time
E550	DAQ VERSION ERR	Wrong DAQ Memory version	For Info only	Installation new softw
E551	DAQ WRITE ERR	Problem writing DAQ Memory	For Info only	Traceability function, whole cycle
E552	DAQ FULL ERR	DAQ Traceability Memory is Full	For Info only	Traceability function, whole cycle
E553	STORE DAQ>PC	DAQ Traceability Memory is almost Full	For Info only	Traceability function, whole cycle
E600-E628	SOFTW ERR	Software Error	Full stop + safety time	Any time

INSTALLATION AND MAINTENANCE MANUAL

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2. IMPORTANT SAFETY INSTRUCTIONS

WARNING - SAVE THESE INSTRUCTIONS FOR LATER USE.
Failure to comply with the instructions may lead to incorrect use of the appliance, and may result in risk of fire, bodily injuries or death and/or damage to the laundry and/or the appliance.

WARNING - Read the IMPORTANT SAFETY INSTRUCTIONS in this manual carefully before operating the appliance. Improper use of the appliance may cause risk of fire, electrical shock or serious body injuries or death as well as serious damage to the appliance.

- This English version is the original version of this manual. Without this version, the instructions are incomplete.
- Before installation, operation and maintenance of the machine read carefully the complete instructions, i.e. this „Installation, maintenance and user's manual“, „Programming manual“ and „Spare parts manual“. The Programming manual and Spare parts manual are not delivered with a machine by default. You shall ask the supplier / manufacturer to obtain Programming manual and Spare parts manual.
- Follow the instruction written in manuals and keep the manuals in a proper place by the machine for later use.
- Safety instructions included in manuals for personnel operating the appliance must be printed and posted on a visible place near the machine in the laundry room.
- The washer extractor is designed for fabrics washing only, other objects can damage the washer and can cause damage or injuries.
- The manufacturer is not responsible for the damage to the fabrics that are washed by an inappropriate washing method.
- Always follow the instructions and/or warnings that are stated on the fabrics, washing products or cleaning products mentioned by the manufacturer.
- The washer must be set up in accordance with the instructions. All drain, inlet, electrical connections, ventilation, groundings and other connections must be done in according to the installation manual, in compliance with the local standards done by qualified technicians with proper authorization.
- The valid standards for connecting to the local power network (TT,TN,IT,..) must be followed. In the standard execution, the appliance may not be suitable for connecting to an IT supply system. Contact your commercial distributor for assistance.
- All appliances are produced according the EMC-directive (Electro-Magnetic-Compatibility). They can be used in restricted surroundings only (comply minimally with class A requirements). For safety reasons there must be kept the necessary precaution distances with sensitive electrical or electronic device(s).
- Do not change the parameters of the frequency inverter. This can cause serious injury, fire, washer damage, etc.
- During transportation and storage never use excessive forces on the packing because components can be damaged protruding the contour line of the appliance.
- Use copper conductors only. This appliance must be connected to a supply circuit to which no lighting units or general-purpose receptacles are connected.
- Any changes concerning the installation which are not described in this Installation Manual must be approved by the supplier or manufacturer. Otherwise, the supplier and manufacturer are not responsible for potential injuries to operators or for any damages. Interventions in the appliance execution or functions are not allowed, and the manufacturer refuses any responsibility in such cases.
- The washer extractor must be installed on level. If not, the washer may become unbalanced during extraction and, although fitted with an unbalance safety, the washer may become seriously damaged what may result in bodily injuries.
- Never put the washer in operation when the transporting braces are not removed. The washer should always be tested before use.
- It is possible that there are residues of products used during the production process in the new washer. These residues could cause stains on your laundry. Therefore, you must first run at least 1 hot wash with old rags before using for your normal laundry.
- Keep the appliance top and surface and the area around clean and clear of combustible or flammable products.
- Do not store flammable materials around the appliances. Define the dangerous areas in the laundry room and obstruct an admission to them during appliances operating.
- Do not wash articles that have been previously cleaned in, wash in soaked in, or spotted with gasoline, dry-cleaning solvents, or other flammable or explosive substances as they give off vapors that could ignite or explode.
- Do not add gasoline, dry-cleaning solvents, or other flammable or explosive substances to the wash water. These substances give off vapors that could ignite or explode.
- Under certain conditions, hydrogen gas may be created in the hot water system that has not been used for two or more weeks. HYDROGEN GAS IS EXPLOSIVE. If the hot water system has not been used for such period open all hot water taps and let the water run out for few minutes. This will release any accumulated gas. As this gas is flammable, do not smoke or use open flames during this time.

- TEMPERATURE IN WASHING MACHINE TUB: The electronic controller uses the temperature sensor in the tub to control the temperature of the washing bath. There are a lot of things that have influence on the temperature measurement. Therefore the temperature control of the washing bath is not very precise.
- Always strictly comply with the instructions that are written on the laundry chemicals-, laundry aids-, dry-cleaning solvents- and disinfectants packaging to avoid personal injury. Keep these agents out of the reach of children, preferably in a locked cabinet.
- Do not tamper the washer-extractor controls and do not bypass the safety instructions and the warnings.
- Do not use some means on the soap dispenser lid to hold it open by filling or when the machine operates. The discharge or splashing of hazardous liquid can cause serious scalding and burning.
- Do not operate the appliance when parts are broken or missing or when covers are open. The appliance must not be operated until the fixed guards are put correctly in place.
- The appliance must not be stored, installed or exposed to the weather, extreme low or high temperature and humidity levels. Do not hose down the washer. NEVER allow the appliance to get wet.
- Check the functioning of the door lock mechanism on regular base. NEVER bypass the doorlock mechanism.
- Disconnect the power and close all water and steam supply before cleaning, servicing and at the end of each operating day.
- Out of the venting on the upper part of the washer can escape warm vapor or and hot air. Do not cover the vent but protect it sufficiently. It serves air gap and as a vapor outlet to prevent pressure building in the washer.
- Do not repair or replace any part of the appliance or attempt any servicing unless specifically recommended in the service manual or published user-repair instructions that you understand and have the skills to carry out. Only qualified service personnel may open the appliance to carry out servicing.
- Information contained in this manual is intended for use by a qualified service technician familiar with proper and safe procedures to be followed when repairing an electrical appliance. All tests and repairs should be performed by a qualified service technician equipped with proper tools and measuring devices. All component replacements should be made by a qualified service technician using only factory approved replacement parts.
- Improper assembly or adjustment may occur if service or repair is attempted by persons other then qualified service technicians or if parts other then approved replacement parts are used. Improper assembly or adjustment can create hazardous conditions.
- There can be a risk of injury or electrical shock while performing services or repairs. Injury or electrical shock can be serious or even fatal. Consequently, extreme caution should be taken while performing voltage checks on individual components or a product. PLEASE NOTE: Except as necessary to perform a particular in servicing a product, the electrical power supply should ALWAYS be disconnected when servicing a product.
- All industrial (OPL - On Premise Laundry) washers are designed for use in Laundry with professionally trained attendants.
- Before the appliance is removed from service or discarded, remove the door.
- Any Water or Steam Leaks Must Be Repaired Immediately. Closed supply immediately.
- If any problems or failures should arise, immediately contact your dealer, serviceman or manufacturer.
- The manufacturer reserves the right to change the manuals without previous notice.

⚠ **WARNING -- CAUTION**

This appliance must be connected to a grounded metal, permanent wiring system, and additionally an equipment-grounding conductor must be run with the circuit conductors and connected to the equipment-grounding terminal or lead on the appliance.

⚠ **WARNING -- CAUTION**

In order to minimize the risk of fire, electrical shock and injury, <u>THIS WASHER MUST BE PROPERLY GROUNDED</u>. Never plug in or direct-wire an appliance unless it is properly grounded in accordance with all local and national codes.
If more appliances in the same location, mutual grounding must be applied where possible.

⚠ **WARNING -- CAUTION**

The washer extractor is intended to be permanently connected, it MUST be secured mounted to a NON-COMBUSTIBLE, adequate floor structure. A concrete foundation is required. Metal reinforced wood floors are NOT allowed due to the risk of fire and excessive vibrations.
NEVER install the washer on an upper floor or over a basement without a load support designed by a structural engineer.

⚠ WARNING - Although the appliance may be in the „off“ position, there is still electrical power to the switch supply terminals.

⚠ WARNING - When power supply has been switched off wait for at least 10 minutes before starting inspection or servicing the washer. Before starting inspection of frequency inverter, check for residual voltage across main circuit terminals + and -. This voltage must be below 30 VDC before you can access the inverter for inspection.

⚠ WARNING - Do not allow children to play on, in or around the appliance at any time. Close supervision of children is necessary when the appliance is used near children. Never permit children to operate the appliance.

⚠ WARNING - Do not open door until cylinder remains stopped and water has been drained completely. If the door safety lock does not work, do not use washer until the door lock mechanism is repaired.

⚠ CAUTION! - Follow all valid basic safety rules and laws. The instructions in this manual cannot account for every possible dangerous situation. They must be generally understood. Caution and care are factors which can not included in the design of the appliance and all persons who install, operate or maintain the appliance must be qualified and familiar with the operating instructions. It is up to the user to take proper care when operating the appliance.

⚠ CAUTION! - Do not remove warning signs placed on the appliance. Observe signs and labels to avoid personal injuries. Safety labels appear at crucial locations on the appliance. Failure to maintain legible safety labels could result in injury to the operator or service technician.

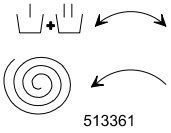
⚠ CAUTION! - If the installed appliance operate with coin, token or similar operation for use in self-service situations, then the owner-installer must provide a remote-located emergency stop device. This device must be placed in such a way that it is easy and safely accessible for the users. The emergency stop device takes care that at least the control circuit of the appliance is interrupted.

2.1. SYMBOLS ON THE MACHINE

Warning, read and keep written instructions

Dangerous electric current, electric appliance

Press the emergency button in danger



Direction of the drum rotation during prewash + wash

Direction of the drum rotation during spin and moving round a slight amount

2.2. IMPORTANT INFORMATION BEFORE INSTALLATION

FOR TRANSPORTATION AND STORAGE

IN CASE OF TRANSPORTATION AND STORAGE, WATCH COMPONENTS PROTRUDING FROM THE CONTOUR LINE OF MACHINE (DOOR LOCKS ETC.), TO AVOID INJURIES.

– Never push, pull or exert pressure on components protruding from the machine contour line (controls, door locks etc.).
– Make sure that these components are secured so as to avoid damages during machine manipulation and installation.
– In case of the machine transportation by the customer, follow the manufacturer's instructions for transportation, handling and storage of the product. In case of transportation of machine by the customer the manufacturer is not responsible for possible damage of machine in the course of transportation. In case of storage the machine in a free area it must be protected against mechanical damage and weather condition factors.

FOR INSTALLATION

ALL CONNECTION, AND IN SPECIAL PROTECTING EARTH, MUST BE PERFORMED BY QUALIFIED PERSONNEL WITH A PROPER AUTHORIZATION ACCORDING THE INSTALLATION MANUAL IN COMPLIANCE WITH LOCAL STANDARDS.

– The washer must not be installed or stored in an area where it will be exposed to water and/or weather. Avoid damp conditions where water or moisture could run down the walls and covers of the washer or cover the floor around the washer. Do not install the washer above an open gutter. Close any nearby gutters so that waste water steam cannot collect near/inside the washer.
– Any changes in the machine installations must be approved by manufacturer. Otherwise the manufacturer is not responsible for possible injuries or damages. Interference and changes in the machine construction are not allowed and the manufacturer refuses any responsibilities in such cases.
– Define dangerous areas in the laundry room and do not allow people to enter if the machine is in operation.

MACHINE INFORMATION

– This manual contains information for the barrier or non barrier spring-mounted machine with load of dry linen 70kg / 160lb, 90 kg / 200 lb, 110kg / 245lb, 140 kg / 310 lb, 180 kg / 400 lb.
– Verify the machine model according to your order and the data plate located, on the cover of the machine, near the filling door and find corresponding information in the manual.
– The machine is controlled by an electronic control. Find the programming instructions in the programming manual.
– Additional heating can be provided by electrical heating elements or by steam from an external steam supply.
– Water inlets can use warm, cold soft and cold hard water. A machine can be equipped with a recycled discharging, extend the quantity of dosing pumps and the soap hopper.
– The machine has 5 hoppers, (10 hoppers, valid for 180 kg / 400 lb) filled from the side part of the washing machine, fig. 3.3., pos.26.

3. TECHNICAL SPECIFICATION

3.1. WASHERS 70 kg / 160 lb, 90 kg / 200 lb, 110 kg / 245 lb

DRY LOAD CAPACITY:				
loading ratio 1/10	kg / lb	**70 / 154**	**90 / 198**	**110 / 242**
loading ratio 1/11	kg / lb	**63 / 139**	**83 / 183**	**100 / 220**
MACHINE DIMENSIONS (1)				
Width	mm / inch	2025 / 79,72	2275 / 89,56	2325 / 91,53
Depth	mm / inch	1615 / 63,58	1615 / 63,58	1615 / 63,58
Height	mm / inch	1805 / 71,06	1805 / 71,06	1855 / 73,03
PACKING DIMENSIONS				
Width	mm / inch	2100 / 82,67	2355 / 92,71	2400 / 94,48
Depth	mm / inch	1740 / 68,50	1740 / 68,50	1740 / 68,50
Height	mm / inch	1985 / 78,14	1985 / 78,14	2080 / 81,88
Transportation volume	m³ / ft³	7,3 / 258	8,1 / 286	8,7 / 307
INNER DRUM DIMENSIONS				
Type		dividing Y / Pullman	dividing Y / Pullman	dividing Y / Pullman
Number of chambers		2 / 3	2 / 3	2 / 3
Diameter	mm / inch	1000 / 39,36	1000 mm / 39,36“	1100 mm / 43,30“
Depth	mm / inch	900 / 35,43	1150 mm / 45,27“	1200 mm / 47,24“
Drum volume	dm³ / gal	700 / 184	900 / 237	1100 / 291
Door opening	mm / inch	765 x 340 / 30,11 x 13,38		
WEIGHT				
Net	kg / lb	2600 / 5732	2810 / 6195	2990 / 6592
Gross	kg / lb	2760 / 6085	2970 / 6548	3150 / 6945
ELECTRICAL DATA				
Power supply - deviations		3x380-480V 50/60Hz 3x200-240V 50/60Hz -6% do +10% of the voltage supply ±1 Hz		
Motor output	kW	11		15
Power supply system capacity	kVA	steam heating: 20 electrical heating 54kW: 70 electrical heating 72kW: 88		steam heating: 28 el. heating 72kW: 93 el. heating 96kW: 120
INPUT POWER				
Electrical heating 54 kW	kW	60		-
Electrical heating 72 kW	kW	78		85
Electrical heating 96 kW	kW	-		109
Steam or without heating	kW	11,5		15,5
Rated heating input power (electrical heating only)		54kW, 72kW		72kW, 96kW
SUPPLY PROTECTION DEVICE		Use „slow“ type Protection devices (circuit breakers: **curve D**)		
Residual current device (RCD)	mA	100, class B		
Steam or without electrical heating				
200 - 240V 3AC	A	63		75
380 - 480V 3AC	A	32		50
El. heating 54 kW (380-480V 3AC)	A	100		-
El. heating 72 kW (380-480V 3AC)	A	160		
El. heating 96 kW (380-480V 3AC)	A	-		160
WASHING FUNCTIONS				
Washing	RPM	36		35
Distribution	RPM	60		
Low extraction	RPM	550		
High extraction	RPM	800		754

Tab.3.1.

DRY LOAD CAPACITY: loading ratio 1/10 kg / lb loading ratio 1/11 kg / lb	**70 / 154** **63 / 139**	**90 / 198** **83 / 183**	**110 / 242** **100 / 220**
G-factor: Low extraction High extraction	170 360		186 350
CONNECTION			
Water inlet connection inch	BSP 3 x 1,5“ / 1 x ¾“		
Water pressure range MPa / bar / PSI	0,3 - 0,6 / 3 - 6 / 43 - 87		
Maximal water temperature °C / °F	90 / 194		
Drain diameter mm / inch Drain flow rate $dm^3.min^{-1}$ $gal.min^{-1}$	1 x Ø126 / 5 (standard) - to the drain + 1 x Ø126 / 5 (according to the request) - to the recycling tank 600 158		
Drain connection - applicable for wash bath sample inch	1 x ½“ - applicable for wash bath sample		
Steam connection inch	G 1“		
Steam pressure MPa / bar / PSI	0,6 - 0,8 / 6 - 8 / 87 - 116		
Press air connection mm / inch Air pressure MPa / bar / PSI	internal Ø10 / 0,4“ 0,6 / 6 / 87		
Powder dispenser cups	5		
Liquid soap signals	internal G½“		
Number of liquid soap supply system connection points	1		
Venting connection of outer drum mm / inch	outer Ø115 / 4 ½“		
CONSUMPTION (2)			
Steam Average $kg.hour^{-1}$ / $lb.hour^{-1}$	68 / 150	82 / 181	102 / 225
ANCHORING			
Anchoring bolt	4 pcs, M20x350		
GENERAL DATA			
Ambient temperature °C / °F Relative humidity Height above sea level m / ft Storage temperature °C / °F Emission: emitted heat kW	5 to 35 / 41 to 95 30% to 90% without condensation up 1000 / 3280 1 to 55 / 34 to 131 7		
Max. static loading of the floor by weight of the machine and filler kN	31,57	35,67	39,47
Static load on floor during extraction kN	27,12	29,54	31,66
Dynamic force amplitudes during extraction kN	± 1,06	± 1,24	± 1,41
Frequency of dynamic load Hz	13,4	13,4	12,6
SOUNDS LEVELS (3)			
L_{Aeq} extraction seq. db	76		85

Tab.3.1.continuation

(1) maximum dimensions including protruding parts
(2) depend on related wash parameters
(3) ISO 3744

3.2. WASHERS 140 kg / 310 lb, 180 kg / 400 lb

DRY LOAD CAPACITY:			
loading ratio 1/10	kg / lb	**140 / 308**	**180 / 396**
loading ratio 1/11	kg / lb	**127 / 280**	**163 / 360**
MACHINE DIMENSIONS (1)			
Width	mm / inch	2435 / 95,86	2585 / 101,77
Depth	mm / inch	1805 / 71,06	1905 / 75
Height	mm / inch	2075 / 81,69	2165 / 85,23
PACKING DIMENSIONS			
Width	mm / inch	2485 / 97,83	2665 / 104,92
Depth	mm / inch	1940 / 76,37	2040 / 80,31
Height	mm / inch	2250 / 88,58	2265 / 89,17
Transportation volume	m³ / ft³	10,8 / 381	12,3 / 434
INNER DRUM DIMENSIONS			
Type		dividing Y / Pullman	dividing Y
Number of chambers		2 / 3	3
Diameter	mm / inch	1200 / 47,24	1300 / 51,18
Depth	mm / inch	1250 / 49,21	1400 / 55,11
Drum volume	dm³ / gal	1400 / 369,8	1800 / 475,5
Door opening	mm / inch	765 x 440 / 30,11 x 17,32	
WEIGHT			
Net	kg / lb	3550 / 7826	4990 / 11001
Gross	kg / lb	3760 / 8289	5310 / 11707
ELECTRICAL DATA			
Power supply - deviations		3x380-480V 50/60Hz 3x200-240V 50/60Hz -6% do +10% of the voltage supply ±1 Hz	
Motor output	kW	18,5	22
Power supply system capacity	kVA	steam heating: 34 electrical heating 72kW: 100 electrical heating 96kW: 125	steam heating: 41 - -
INPUT POWER			
Electrical heating 72 kW	kW	91	-
Electrical heating 96 kW	kW	115	-
Steam or without heating	kW	19	22,5
Rated heating input power (electrical heating only)		72kW, 96kW	-
SUPPLY PROTECTION DEVICE		Use „slow“ type Protection devices (circuit breakers: **curve D**)	
Residual current device (RCD)	mA	100, class B	
Steam or without electrical heating			
200 - 240V 3AC	A	100	100
380 - 480V 3AC	A	63	75
El. heating 72 kW (380-480V 3AC)	A	160	-
El. heating 96 kW (380-480V 3AC)	A	200	-
WASHING FUNCTIONS			
Washing	RPM	33	36
Distribution	RPM	60	55
Low extraction	RPM	550	
High extraction	RPM	720	695

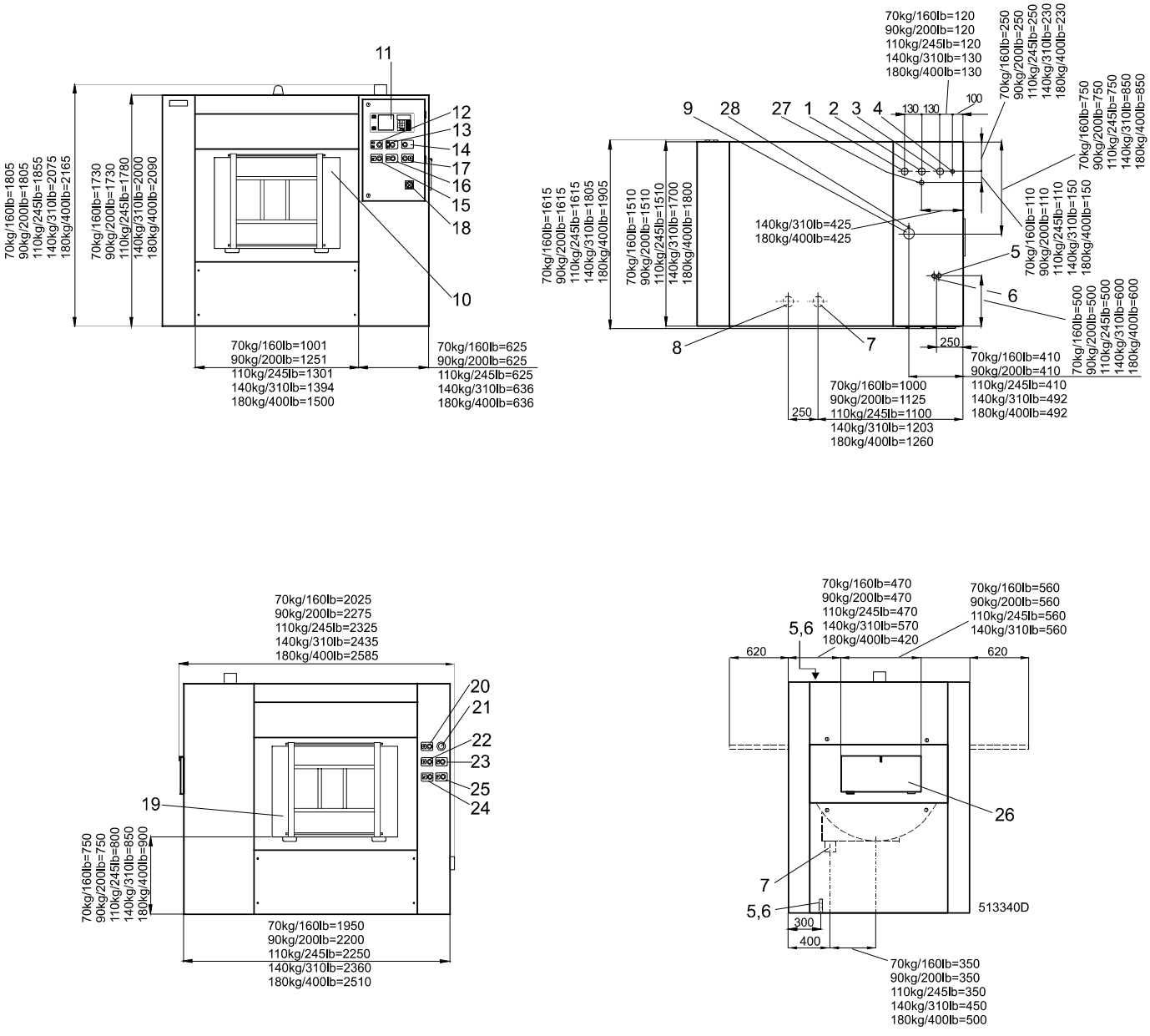
Tab.3.2.

DRY LOAD CAPACITY: loading ratio 1/10 kg / lb loading ratio 1/11 kg / lb	**140 / 308** **127 / 280**	**180 / 396** **163 / 360**
WASHING FUNCTIONS		
G-factor: Low extraction	220	217
High extraction	350	
CONNECTION		
Water inlet connection inch	BSP 3 x 1,5“ / 1 x ¾“	BSP 3 x 1,5“ / 1 x 1“
Water pressure range MPa / bar / PSI	0,3 - 0,6 / 3 - 6 / 43 - 87	
Maximal water temperature °C / °F	90 / 194	
Drain diameter mm / inch	1 x Ø126 / 5 (standard) - to the drain + 1 x Ø126 / 5 (according to the request) - to the recycling tank	
Drain flow rate $dm^3.min^{-1}$ $gal.min^{-1}$	600 158	
Drain connection - applicable for wash bath sample inch	1 x ½“ - applicable for wash bath sample	
Steam connection inch	G 1“	
Steam pressure MPa / bar / PSI	0,6 - 0,8 / 6 - 8 / 87 - 116	
Press air connection mm / inch Air pressure MPa / bar / PSI	internal Ø10 / 0,4“ 0,6 / 6 / 87	
Powder dispenser cups	5	10
Liquid soap signals	internal G½“	
Number of liquid soap supply system connection points	1	
Venting connection of outer drum mm / inch	outer Ø115 / 4 ½“	
CONSUMPTION (2)		
Steam Average $kg.hour^{-1}$ / $lb.hour^{-1}$	135 / 298	176 / 388
ANCHORING		
Anchoring bolt	4 pcs, M20x350	
GENERAL DATA		
Ambient temperature °C / °F Relative humidity Height above sea level m / ft Storage temperature °C / °F Emission: emitted heat kW	5 to 35 / 41 to 95 30% to 90% without condensation up 1000 / 3280 1 to 55 / 34 to 131 7	
Max. static loading of the floor by weight of the machine and filler kN	48,75	64
Static load on floor (intermittent vibrations) kN	37,74	52,78
Dynamic force amplitudes during extraction kN	± 1,53	± 1,98
Frequency of dynamic load Hz	12	11,6
SOUNDS LEVELS (3)		
L_{Aeq} extraction seq. db	80	

Tab.3.2.continuation

(1) maximum dimensions including protruding parts
(2) depend on related wash parameters
(3) ISO 3744

3.3. DIMENSIONS AND COMPONENTS OF THE MACHINE



1. Hard cold water inlet
2. Soft cold water inlet
3. Hot water inlet
4. Steam inlet
5. Supply of pressure air
6. Power supply
7. Main drainage valve
8. Recycling drainage valve
9. Venting of the machine
10. Door of loading (dirty side)
11. Programmer
12. Change-over switch
13. Signal of machine running (+ operating air pressure)
14. Centralstop
15. Button of door unlocking
16. Button of drum positioning
17. Button of door locking
18. Main switch
19. Door of unloading (clean size)
20. Signal of loading
21. Centralstop
22. Button of door locking
23. Button of activation of loading side
24. Button of door unlocking
25. Button of drum positioning
26. Soap hoppers
27. Soft cold water inlet into soap hoppers
28. Liquid detergent inlet

Fig.3.3. Placement of components on the machine (dimensions are given in mm)

4. INSTALLATION

4.1. HANDLING, TRANSPORT AND STORAGE

TRANSPORT AND STORAGE

⚠ WARNING!
FORKS OF HIGH LIFTING TRUCK MUST HAVE SUFFICIENT LENGTH (SEE FIG. 4.1.A).

For handling the machine in packing, use the fork lift truck or four (alternatively two) manual pallet trucks. The machine pallet is designed for handling in both (mutually vertical) directions, see fig. 4.1.B. and 4.1.C.

– If possible, leave the machine in the transporting package or at least let it set on the transporting wooden skid until the time of final installation on the foundation according the chapter 4.3. of this manual.

Dimension „**X**“, see tab.3.1., 3.2
Machine width or depth - according to direction of handling.

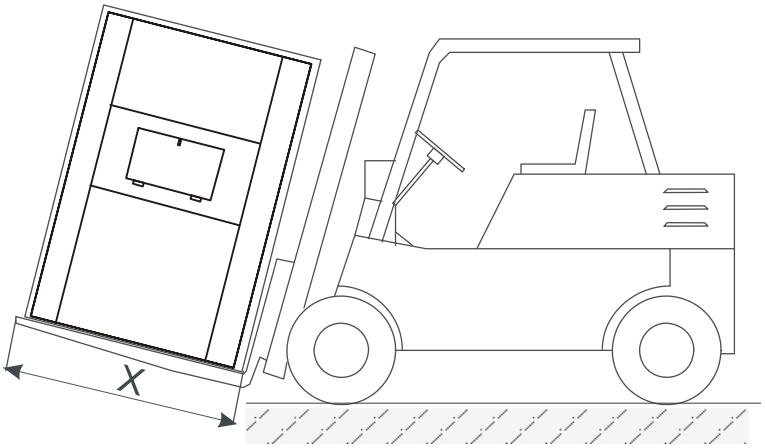


Fig.4.1.A Minimum length „X“ of lift truck forks for machine model

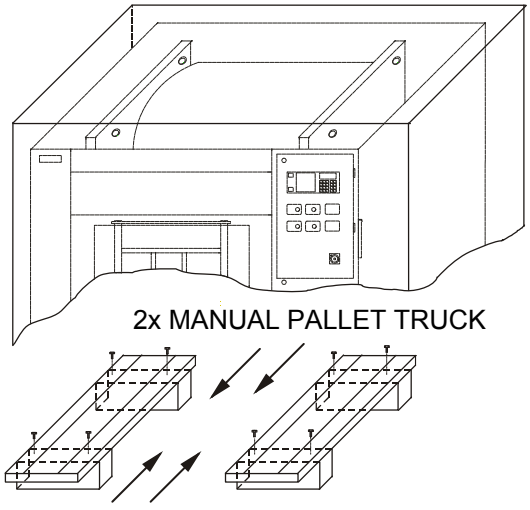


Fig.4.1.B. Handling in direction of loading and unloading

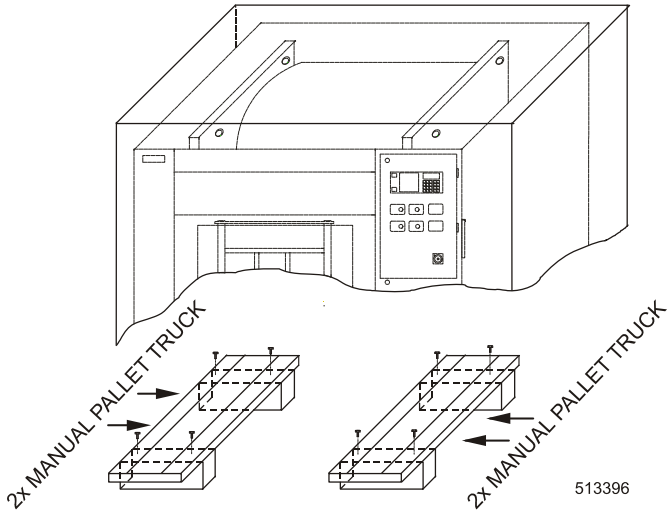


Fig. 4.1.C. Handling in direction of the pulley side and inlet valves side

HANDLING DURING INSTALLATION

All activities can be done only by a worker, who knows all information about the machine. Machine is delivered to the customer in a wooden packing or wooden crate and protected with polyethylene film. The machine is attached to the skid by means of four bolts.
To remove the machine to its final position follow these precautions:

– All passages and spaces the machine has to be transported through at installation should be reasonably dimensioned to meet the height and width of the machine including the package.
– **Never push, pull or press the components protruding from the contour line of machine (front part of the machine, filling door, control elements, belt cover, water inlet and outlet pipes etc.).**

MAKE SURE THAT THESE COMPONENTS ARE SECURED SO AS TO AVOID THEIR DAMAGE DURING HANDLING AND INSTALLATION OF THE MACHINE.

– **Make sure that the filling door are secured to avoid its opening during the handling.**
– Lift the machine up by the fork-lift truck or by pallet trucks using a transport skid to which the machine has been attached.

UNPACKING

After unpacking, check if the machine has not been damaged and if all the accessories are included according to your order. Verify the machine model according to your order and the data plate located, on the cover of the machine, near the filling door and find corresponding information in the manual. Manual and accessories are placed inside the drum which is possible to open according to chapter 6.1.

Before the machine is installed on the place, remove the packing, remove the frontal and side covers and remove four screws which fix the machine to the pallet. According to fig.4.1.D., use the lifting feet (4pcs), (1) and fix them using the bolts M12 (2) to the machine frame.
(Feet and bolts are being the part of delivery).
For fixing the feet it is possible to use the following combination of positions:
– loading side (dirty) + unloading side (clean)
– side of pulley + side of inlet valves

Lift the machine up carefully using the pallet trucks and remove the wooden skids. Now, install the machine on its final position carefully and remove the feet. Keep the feet for possible handling later on.

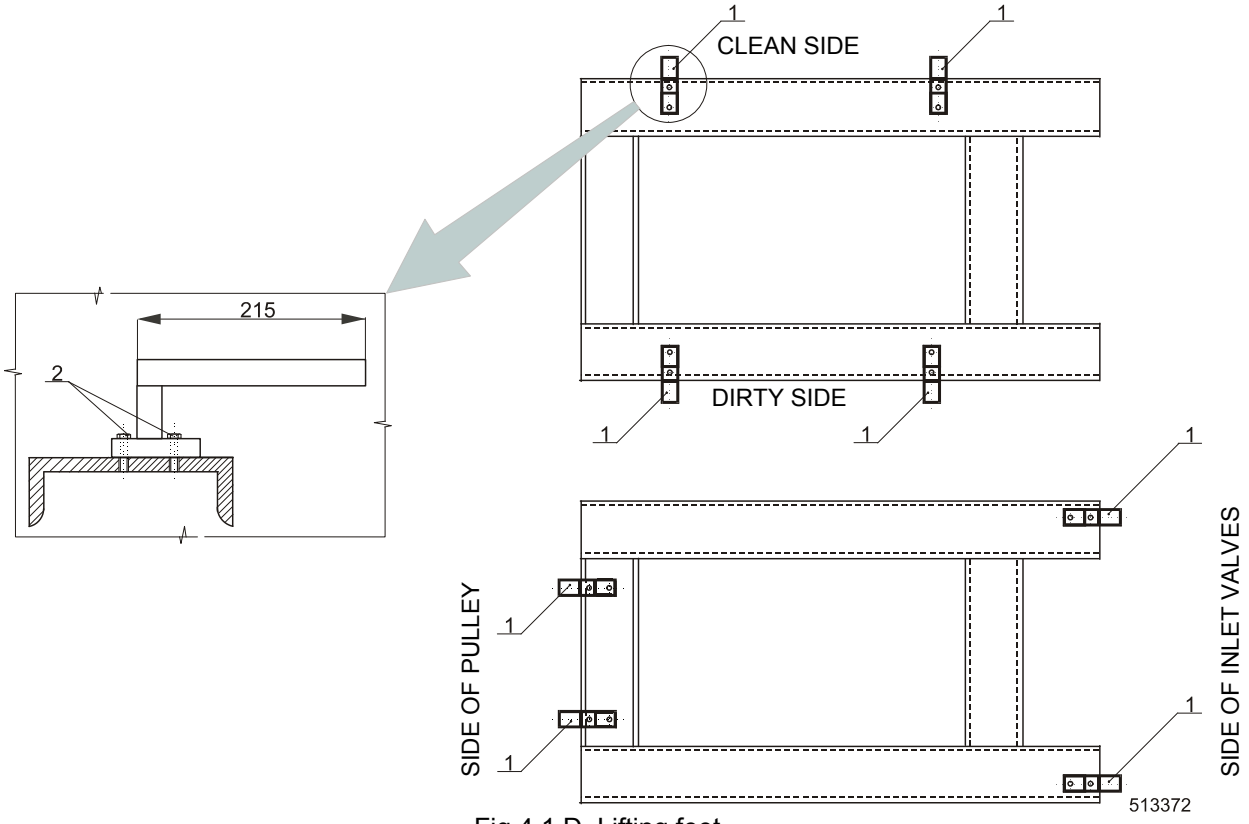


Fig.4.1.D. Lifting feet

HANDLING WITH HUNG MACHINE

In case of need and under certain conditions, it is possible to handle the machine in hanging position. All activities can be done only by a worker, who knows all information about the machine. Use four-point suspension with recommended length of arm 1700 - 1800 mm / 67 - 71“ for handling the machine in hanging position. Four-point suspension must have minimum load capacity 10000 kg / 22046 lb. Do not use any loops (danger of the box damage and electric distributor damage). If the machine is handled in hanging position, it must be hung on all four lifting eyes, fig. 4.1.E., pos.1. The machines are equipped with lifting eyes or holes Ø 30 mm / 1,18“ located on the front of the machine (according the machine model). During the handling with machine in suspension, transport braces must be attached to the machine.

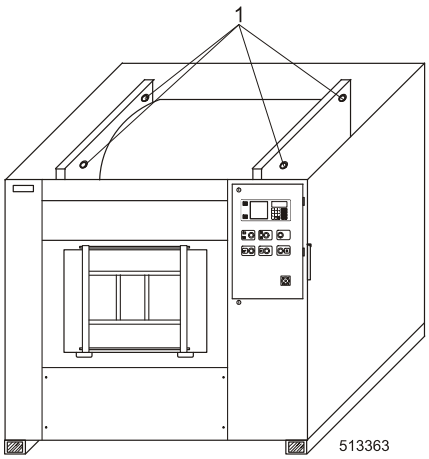


Fig.4.1.E. Hanging eyes for the hook suspension

4.2. SPACE REQUIREMENTS

REQUIRED MACHINE WORKING CONDITIONS

See chapter „3. TECHNICAL SPECIFICATION“.
The washer must not be installed or stored in an area where it will be exposed to water and/or weather. Avoid damp conditions where water or moisture could run down the walls and covers of the washer or cover the floor around the washer. Do not install the washer above an open gutter. Close any nearby gutters so that waste water steam cannot collect near/inside the washer.

SIZE OF A LAUNDRY ROOM

IGNORING THE REQUIREMENT FOR SPACES BETWEEN MACHINES AND WALLS CAN MAKE SERVICE AND MAINTENANCE WORK DIFFICULT.

Total space requirements for the system installation are usually determinate by a detailed plan of the building. The machine dimensions are stated in the chapter „3. Technical specification“. Leave min. 0,8 m / 31,49“ free space between the machine left side and the wall, where the machine stands for the maintenance access. Also between the machine right side and the wall or another machine leave free space minimally 0,8 m / 31,49“, see fig. 4.3.B. The waste piping or outlet channel must be dimensioned to the discharged water quantity and a number of washing machines.

4.3. MACHINE POSITIONING

CARRYING CAPACITY OF THE FLOOR

⚠ WARNING!
IT IS RECOMMENDED TO CONSULT STATIC REQUIREMENTS WITH A STATIC ENGINEER TO MEET THE REQUIREMENTS OF PERMISSIBLE LOADING, VIBRATIONS AND NOISE LEVEL IN THE BUILDING!

FASTENING THE MACHINE

⚠ WARNING!
THE MACHINE MUST ALWAYS BE FIXED TIGHTLY TO THE FLOOR AND MUST FIT RELIABLY TO THE FLOOR IN ALL FOUR SPOTS INTENDED FOR FIXING THE MACHINE!

The machine is to be located on a levelled concrete floor to comply with static and dynamic stress of the machine. Check the position of the machine base frame by a water level. The manufacturer is not responsible for consequences caused by a wrong installation. Find a location for the anchoring bolts for the fixation of the machine on the floor, see fig.4.3.A.

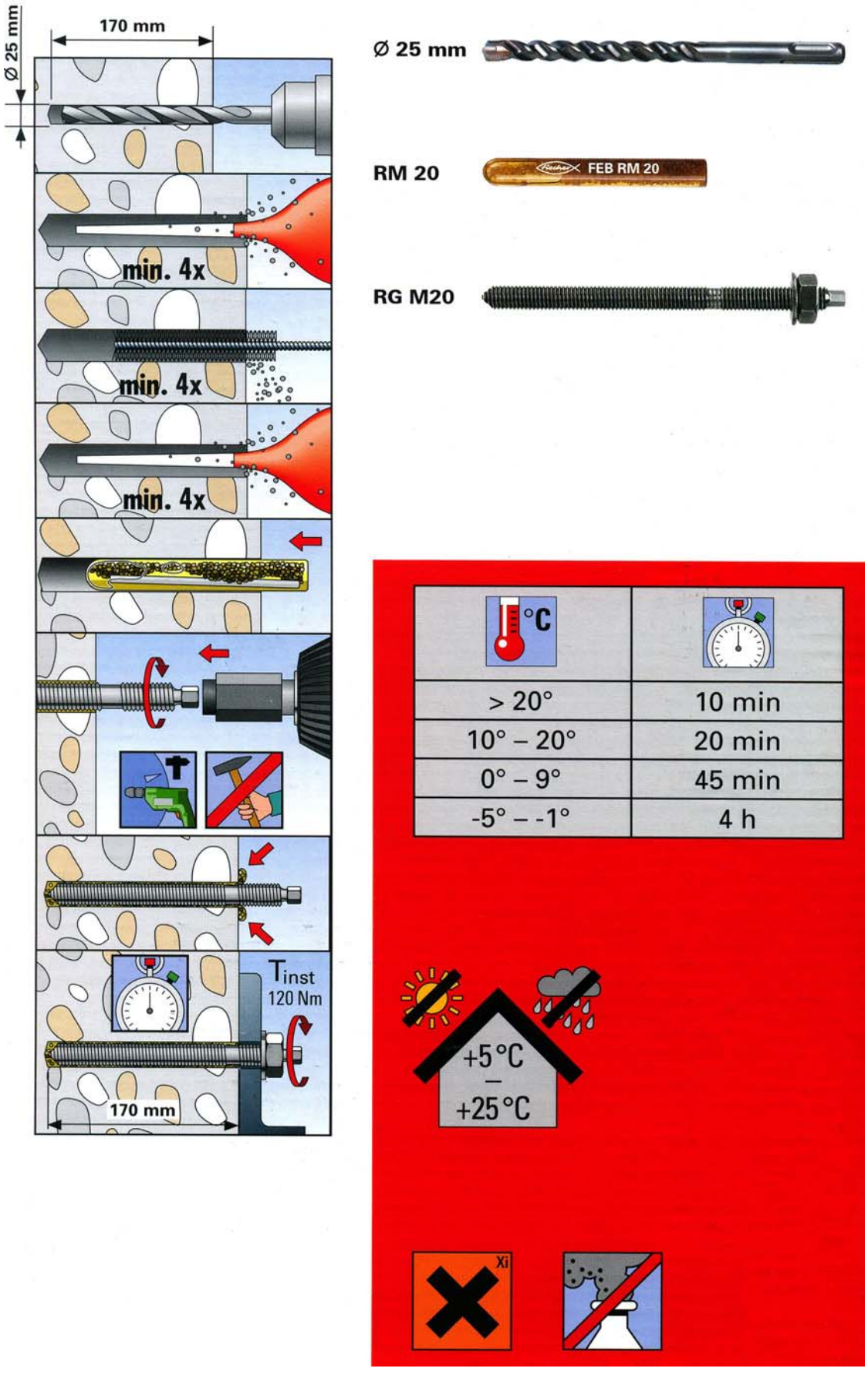


Fig.4.3.A

⚠ WARNING!
THE NUTS OF THE ANCHORING BOLTS HAVE TO BE TIGHTENED BY MEANS OF A TORQUE, SEE FIG.4.3.A. DO NOT TIGSHTEN NUTS OF ANCHORING BOLTS BEFORE THE CONCRETE BASE AROUND THE BOLTS IS COMPLETELY HARDENED.

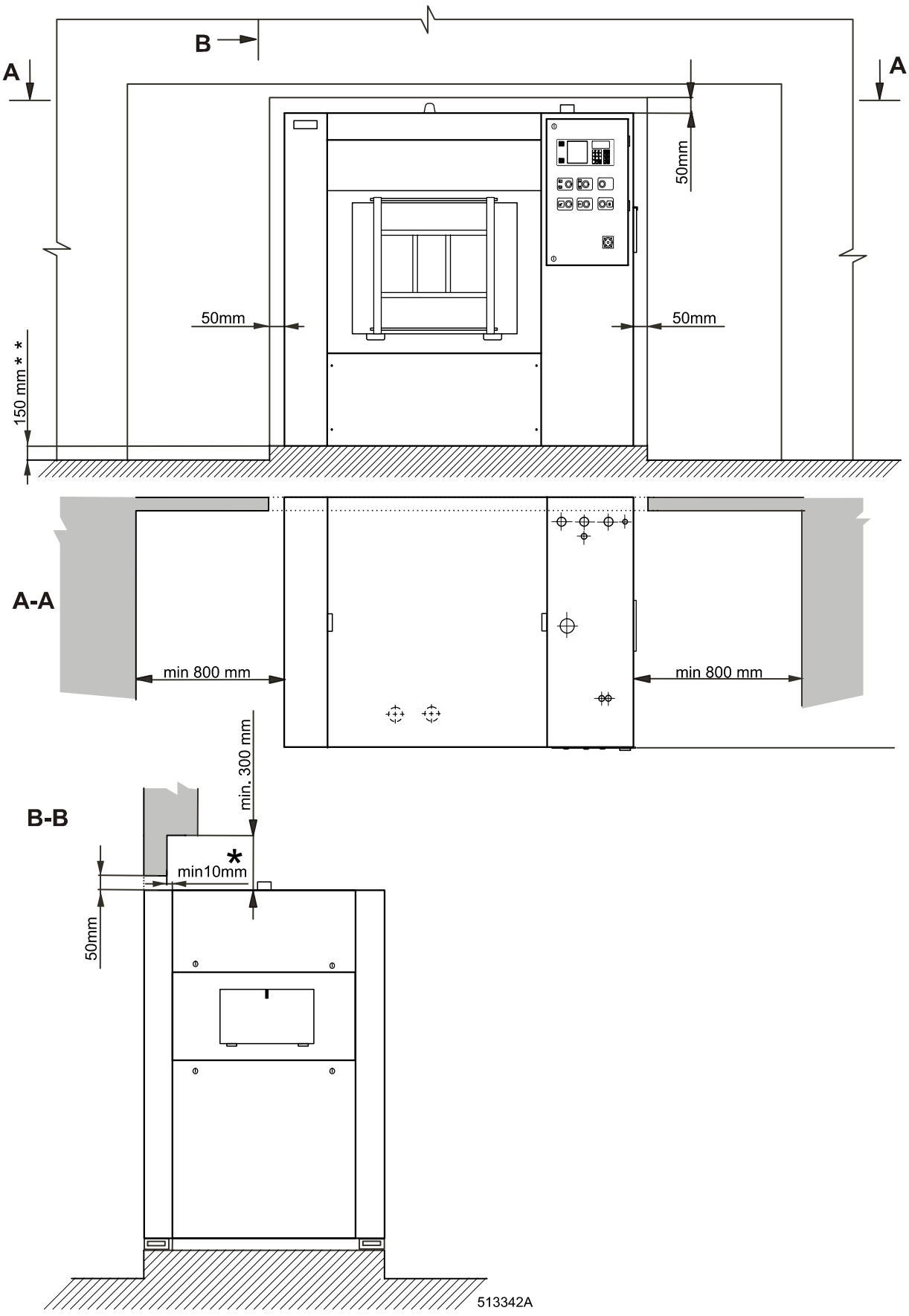


Fig.4.3.B Installation plan

* - Retain minimal distance 10 mm between the parting wall and side covering of the machine.
* * - Increased basement is not necessary for the machine 180 kg / 400 lb

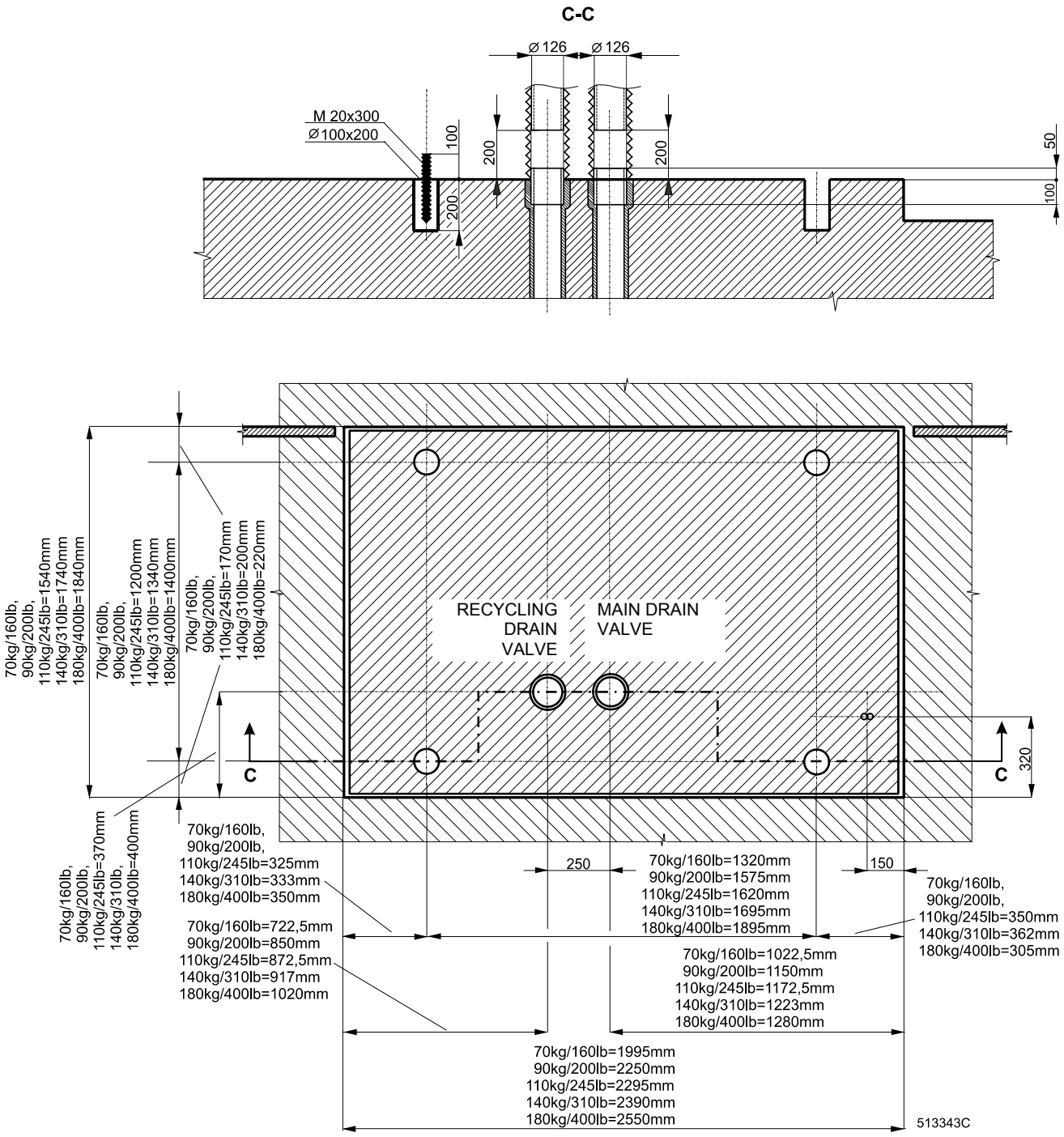


Fig.4.3.C. Basement plan

4.4. CONNECTIONS

CONNECTION OF WATER SUPPLIES

The washer is equipped with 1,5“ BSP (British Standard Pipe Thread) hot and cold water inlet valves, indicated by a sticker next to the inlet. For connection dimensions see fig.3.3. Use the water inlet hoses that accompany the washer as they are properly adapted to the water valves and appliance. Machines with a dosing vessel have a separate supply of cold water into the soap hopper G ¾“, valid for machines 70 kg / 160lb, 90 kg / 200 lb, 110kg / 245lb, 140 kg / 310 lb. Machines 180 kg / 400 lb have a separate supply of cold water into the soap hopper G 1“. NEVER use a rigid connection to the water supply.

The 1“ inlet hoses have on both side BSP thread. To connect them to a NPT installation, an adapter is available. For best operation of the washer, it is necessary to keep the water pressure within the limits stated in the chapter „3. TECHNICAL SPECIFICATIONS“. Water pressure that is below minimum requirements can lengthen the wash cycle or/and not allow proper function of the washer.

It is also necessary to connect ALL available water inlets to a water supply. If a hard water supply is not present, connect it with soft cold water. If no hot water supply is present, contact your dealer for the proper required action.

TO INSTALL

Flush the water system in order to remove any particles that may be in the water system.
Install on the washer the filter device, normally delivered with the washer. Connect to this the inlet water hose with appropriated seal washer where necessary.
When connecting inlet hoses, be sure hose connections are not cross-threaded on the connection devices. Tighten the hoses securely. DO NOT over tighten as this will damage threads on the device(s).
The water hardness can have an influence on the wash results. The soap supplier can help you with making the right decisions concerning hard water, soft water, washing programs, type of soap and other related items to give the best wash results.

HOT WATER

IMPORTANT -- TEMPERATURE IN WASHING TUB
The electronic controller uses the temperature sensor in the tub to control the temperature of the washing bath. There are a lot of things that have influence on the temperature measurement. Therefore the temperature control of the washing bath is not very precise. In principle, the manufacturer strives that the real temperature inside the washer is never higher than the programmed temperature so that textile linen will not be damaged because of too high temperature. If for certain applications a very precise washing bath temperature is necessary, appropriate measures must be taken, see Programming manual.
The manufacturer will refuse any responsibility for all consequences because of inaccurate temperatures inside the washing machine tub.

The hot water supply needs to be large enough to provide the required hot water for the installed washers. For good wash results we advise a hot water supply that is set between 140 - 160°F / 70 - 80°C. To determinate the boiler capacity you can use the data of the water amount in the tub depending on programmed water level stated for individual machine model in Programming manual. Please be aware that boiler capacity depends on boiler temperature, linen, program set up and washing program used.

WATER CONSUMPTION

The water consumption depends on the programmed values in the controller. These default values can be found in the programming manual. For a wash the low water level is used. The high water level is used for rinsing. The programmed units correspond to an average amount of water. You can calculate the total water consumption in one washing program by counting up the amount of water by each washing step.
Be aware that the values received from this calculation is only an estimation of the real water consumption. The deviation depends on many circumstances. In the wash cycle for example there will be taken a mix of warm water and cold water. The mix of the water depends on the temperature of both. The total amount of water consumed depends also on the loading, type of linen and the drum rotation.

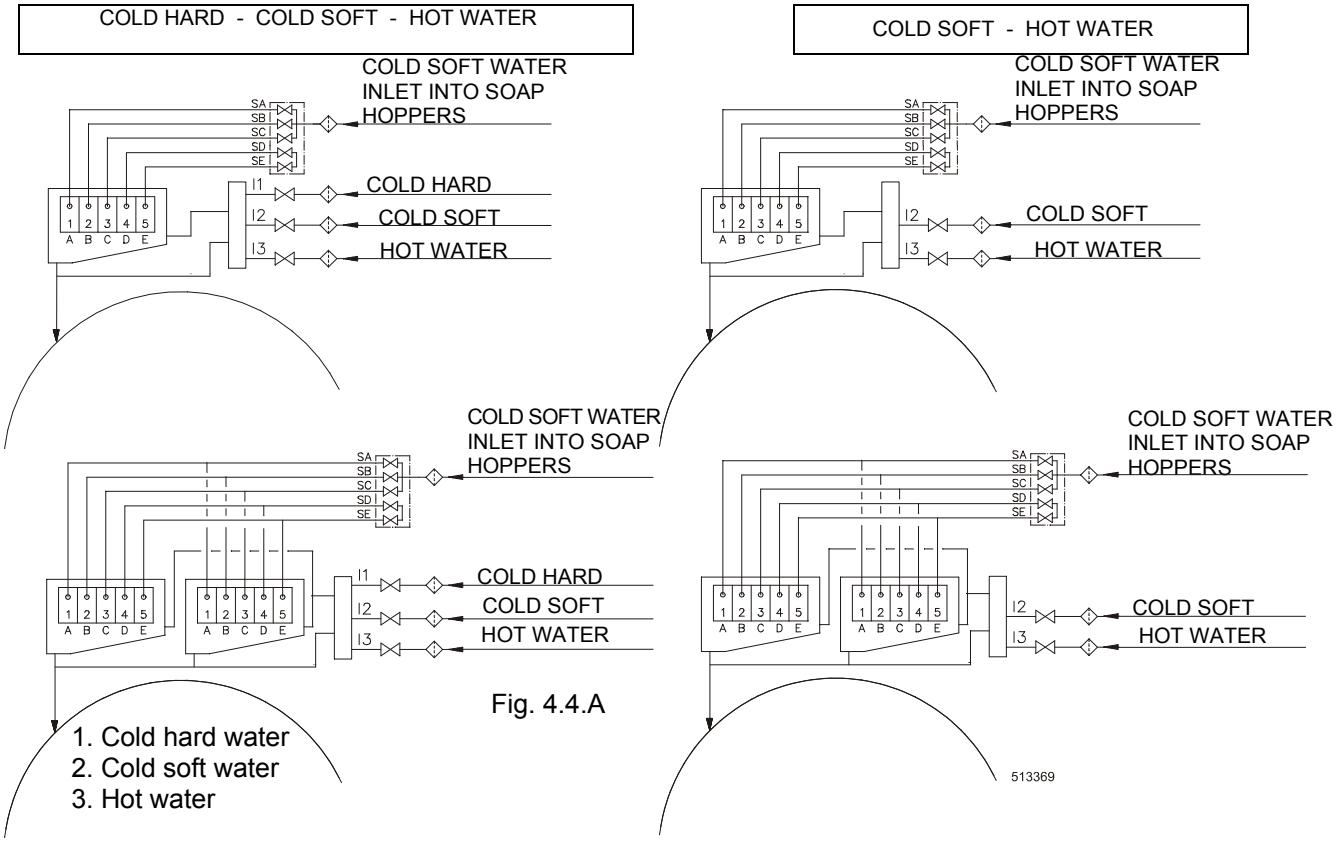


Fig. 4.4.A

1. Cold hard water
2. Cold soft water
3. Hot water

WATER DRAIN CONNECTION

Washing machine is equipped with one drain valve (the second drain valve for recycle drain can be added per order) which must be connected to the waste sump. Position of drain valves, see on fig. 3.3., pos.7, 8. The waste sump must be located lower than the drain pipes because the water discharges from the machines by gravity. Do not reduce the diameter of the machine drain pipes. To connect the machine drainage to a waste sump, you can use the flexible hose (part of delivery). Secure the flexible hose with a clamp. Seal the connecting point of the drain pipe and flexible hose with silicon cement. In same way connect the flexible hose to waste sump throat, fig.4.3.C.

PRESSURE AIR CONNECTION

The distribution of the compressed air of the machine terminates on the air board, see fig.3.3., pos.5 at the connecting plastic coupling. Connect the pressure air supply from the laundry distribution system to this pipe. (After dismantling the plastic coupling, the compressed air can be connected to the inside thread G1/4“.) Operator must install the manual stop-valve into the supply piping. The machine needs compressed air with pressure min. 6 bar to control the valves. Pressure 6 bar should be set on the inlet valve (with regulator and manometer). The pressure switch is set for 4 bar. Set the reduction valve of air springs to 5 bar, applicable for 70 kg / 160 lb, 90 kg / 200 lb, 110 kg / 245 lb, 140 kg / 310 lb. Set the reduction valve of air springs to 3,5 bar - applicable for 180 kg / 400 lb.

VERSION WITH WEIGHING SYSTEM: In the case of a machine with a weighting system, the second pressure switch is set for 4,5 bar, valid for machines 70 kg/ / 160lb, 90 kg / 200 lb, 110kg / 245lb, 140 kg / 310 lb. For machines 180 kg / 400 lb the second pressure switch is set for 3 bar.

STEAM CONNECTION

⚠ WARNING!
INSTALL A STEAM SUPPLY DISCONNECTING DEVICE IN THE VINICITY OF EACH WASHER. DISCONNECT THE STEAM SUPPLY ALWAYS BEFORE ANY SERVICE OR INTERVENTION, GIVING SUFFICIENT TIME TO COOL DOWN THE PARTS TO AVOID INJUIRES.

⚠ WARNING!
BEFORE EVERY STEAM VALVE IT IS NECESSARY TO INSERT THE FILTER WITH PERMEABILITY UP TO 300 MICROMETERS. POSSIBLE DIRT BIGGER THAN 300 MICROMETERS MIGHT DAMAGE THE STEAM VALVE AND CAUSE ITS LEAKAGE.

⚠ WARNING!
IF THE STEAM SUPPLY IS EXECUTED FROM ABOVE, MOREOVER THERE MUST BE AUTOMATIC DRAINAGE PLACED BEFORE THE STEAM VALVE!

For dimensions of steam connection information, see fig.3.3., and technical information table.
Use an inlet steam pressure hoses only, adapted to the steam valve with appropriate seal that is suitable for the applied working pressure.
Take care that by the installation and connection of the steam supply the necessary measure are taken that accidental contact is prevented, this for all persons. Due to the high temperature, direct injury will appear.
To enable a possible dismantling of the steam valve, equipped the attaching point with a connector.
Install the steam piping up to the machine steam valve with fall in direction of flow. This piping should be drained in its deepest spot.

VENTING

⚠ WARNING!
VAPOURS ESCAPE FROM THE MACHINE THROUGH THE AIR VENT OPENING!
(FIGURE 3.3., POSITION 9) DO NOT COVER.

The vent air opening is part of the back flow prevention water system. It also takes care that the tub can not be pressurized by water intake and vapor of the hot water. It allows also proper measuring of the water level. For the safety of everyone make sure that unauthorized persons cannot reach the backside of the machine. Notwithstanding the fact that it is not advised and if measures were taken, you can connect the machine venting pipe to the laundry central duct for exhausting the vapor out of the building. For placing of connection points see fig.3.3. The piping material must withstand a temperature of 80°C / 176°F and generated machine vibrations. The central duct for multiple venting must be dimensioned for the total cross section of venting pipes of all machines. Take care that this installation can not create any injury at anyway.

ELECTRICAL CONNECTION

The machine has been designed for connecting to the power network according the specification of your order. Before connection check the voltage values and the frequency stated in the machine label if they correspond to your power network. The data plate is located on the cover of the machine near the filling door. An individual branch circuit needs to be used for each machine. The way of the connection is described in fig.4.4.B. For electrical protection, there must be installed a residual current device (RCD) and a circuit breaker in the electrical installation of the building (laundry switchboard). For correct selection see below.

IMPORTANT:

- If the machine is not equipped with a main switch then supply disconnecting devices need to be provided in the installation for all electrical supplies connected to the machine, in accordance with EN 60204-1 standard, point 5.3.
- Make sure the supply voltage is always within the limits specified in the „3. Technical specification“ table in all circumstances. When you have long distances in the electrical installation, it may be necessary to use bigger cables to reduce the voltage drop.
- When the machine is connected near a large capacity power supply transformer (500kVA or more, wiring length shorter than 10 m) or there is a power capacitor switch-over, a power supply improving reactor must be installed. If you do not install this, the inverter may get damaged. Contact your sales office for more info.

⚠ WARNING!
GROUNDING: IN EVENT OF MALFUNCTION OR BREAKDOWN OR LEAKAGE CURRENT, THE GROUNDING WILL REDUCE THE RISK OF ELECTRICAL SHOCK AND SERVE AS A PROTECTING DEVICE, BY PROVIDING A PATH OF LEAST RESISTANCE OF ELECTRICAL CURRENT. THEREFORE IT IS VERY IMPORTANT AND THE RESPONSIBILITY OF THE INSTALLER TO ASSURE THE WASHER IS ADEQUATELY GROUNDED AT THE POINT OF INSTALLATION TAKING INTO CONSIDERATIONS THE NATIONAL AND LOCAL CONDITIONS AND REQUIREMENTS.

1. Residual current device (RCD)
2. Laundry electrical switchboard
3. Supply protection device
4. Washing machine
5. Phase conductors
6. Protective conductor
7. Main switch inlet terminal switchboard

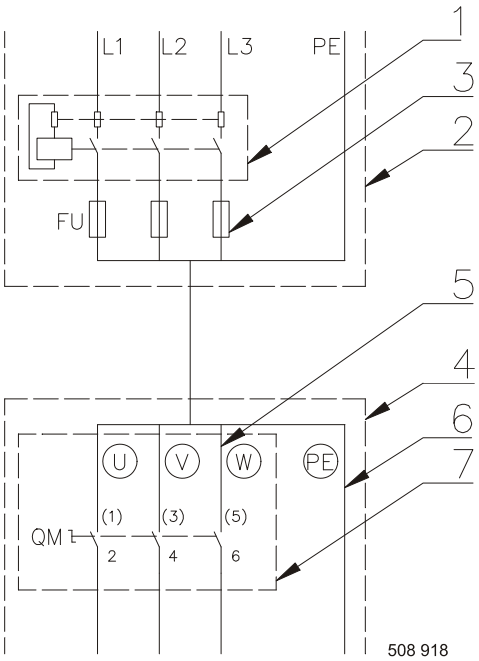


Fig.4.4.B. Machine connection to electrical network (with an earth leakage trip)

RESIDUAL CURRENT DEVICE (RCD)

In some countries an RCD is known as an „earth leakage trip“ or „Ground Fault Circuit Interrupter“ (GFCI) or an „Appliance Leakage Current Interrupter“ (ALCI) or „earth (ground) leakage current breaker“.

Specifications:

– Tripping current: 100mA (if locally not available/allowed use a 30mA trip current, preferably selective type with small time delay set)
– Install max. 2 machines on each RCD (for 30mA, only 1 machine)
– Type B. There are components inside the machine which make use of DC-voltages and therefor a „type B“ RCD is necessary. For information only: Type B is better preformance than type A, and type A is better than type AC.

– When locally allowed, there must always be installed an RCD. In some power network earthing systems (IT, TN-C,…), an RCD might not be allowed (see also IEC 60364).
– The machine control circuits are mostly supplied by a separating transformer. Therefore the RCD may not detect faults in the control circuits (but the fuse(s) of the separating transformer will).

SUPPLY PROTECTION DEVICE

A supply protection device basically protects the machine and wiring against overloads and short circuits.
As supply protection device, you can use either (glow-wire) fuses or (automatic) circuit breakers.
See the table „Technical specifications“ for the rating of the nominal current and other specifications of the supply protection device. In this table there is specified that the protection must be the „slow“ type, for circuit breakers this means curve D. Although not recommended, if for some reason you can not use a slow type, select the protection device with 1 step higher nominal current rating to avoid disconnecting during start-up.

SUPPLY CABLE

The supply cable is not delivered with the machine.

Specifications:
– Conductors with copper cores.
– Stranded conductors are strongly recommended (flexible wiring) to avoid conductor breaking because of vibration.
– THE CROSS SECTION DEPENDS ON THE USED SUPPLY PROTECTION DEVICE. SEE TABLE 4.4.A, FOR THE MINIMAL CROSS SECTION.
– As short as possible, directly from the supply protection device to the machine without branching off.
– No plug or extension cords: The machine is intended to be permanently connected to the electrical network.

Connection:
– Insert the cable through the hole in the on the rear panel, insure a strain relief (turnbuckle) is used so that the supply cable can not move.
– Strip the conductor ends according fig.4.4.C.
– The protective conductor must be longer so that when the cable is pulled out accidentally, this conductor is disconnected the last one!
– With stranded conductors, use „wire end tubes“ with an insulated sleeve (6) for L1/U, (L2/V), (L3/W), (N) conductors. Make sure there can not be accidental contact, since the supply cable stays under voltage even when the main switch is off.
– Crimp a ring terminal (eyelet) to the protection conductor for good fixation to the PE terminal.
– Connect the supply cable conductors to the terminals (main switch (1)) marked with L1/U, (L2/V), (L3/W), (N), and the terminal (copper screw) marked with PE, see fig 4.4.D.
– Provide a sag in the cable, in front of the cable strain relief. This will avoid ingress of condensed water into the machine, see fig 4.4.D.

Power supply protection device nominal current (US)		**Min phase conductor section in mm² (AWG)**	**Min Protection conductor section in mm² (AWG)**
Automatic circuit breakers A	Fuses A		
16 (15)	10 (10)	1.5 (AWG 15)	1.5 (AWG 15)
20 (20)	16 (15)	2.5 (AWG 13)	2.5 (AWG 13)
25 (-)	20 (20)	4 (AWG 11)	4 (AWG 11)
40 (40)	32 (30)	6 (AWG 9)	6 (AWG 9)
63(-)	50 (50)	10 (AWG 7)	10 (AWG 7)
80	63	16	16
100	80	25	16
125	100	35	25
160	125	50	35
200	160	70	50
250	200	95	70
300	250	120	95

Tab.4.4.A Manufacturer's recommended minimal conductor section

MACHINE	SUPPLY VOLTAGE	HEATING TYPE	MAX. CURRENT (A)
70 kg / 160 lb	**3AC 400V**	steam	29
		electrical 54 kW	99
		electrical 72 kW	118
	3AC 230V	steam	50
90 kg / 200 lb	**3AC 400V**	steam	29
		electrical 54 kW	99
		electrical 72 kW	122
	3AC 230V	steam	50
110 kg / 245 lb	**3AC 400V**	steam	40
		electrical 72 kW	122
		electrical 96 kW	157
	3AC 230V	steam	69
140 kg / 310 lb	**3AC 400V**	steam	49
		electrical 72 kW	130
		electrical 96 kW	168
	3AC 230V	steam	85
180 kg / 400 lb	**3AC 400V**	steam	59
	3AC 230V	steam	95

Tab.4.4.B

1. Protection conductor
2. Phase conductor
3. Phase conductor
4. Phase conductor
5. Moulding tube
6. The stripped length of conductors

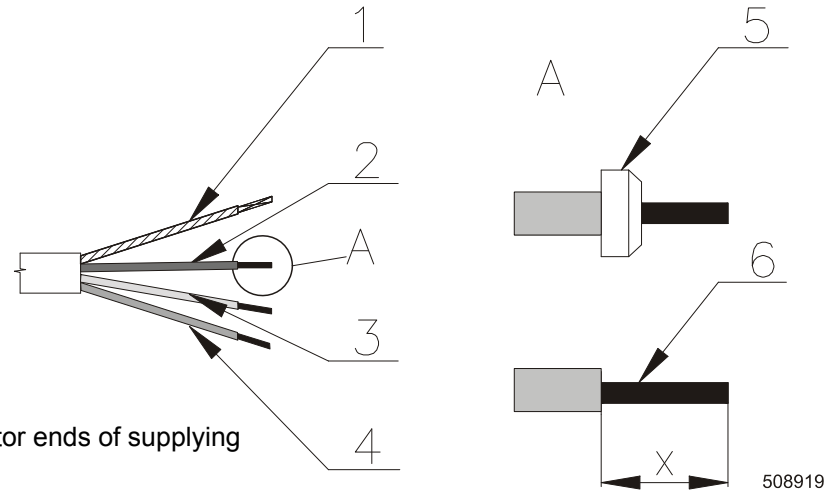


Fig.4.4.C Adaptation of conductor ends of supplying cable

1. Main switch
2. Turnbuckle
3. -
4. Sag of inlet cable

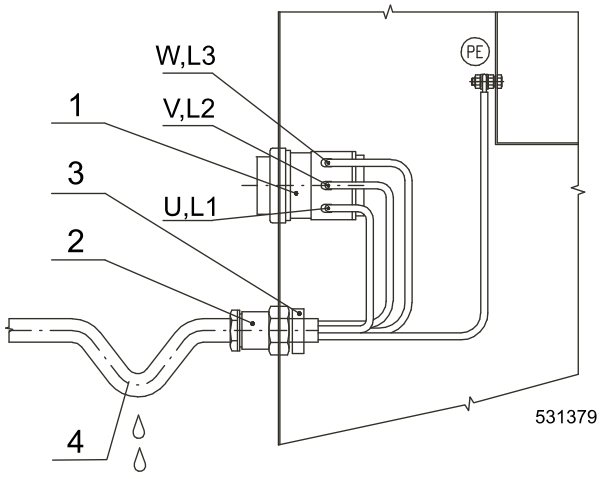


Fig.4.4.D Connection of main power inlet